

## NO DRAWINGS

(21) Application No. 24049/71 (22) Filed 19 April 1971

(45) Complete Specification published 6 Dec. 1972

(51) International Classification A23L 1/26

(52) Index at acceptance A2B 21



## (54) CYCLAMATE-FREE CALORIE-FREE-SWEETENER

(71) We, CUMBERLAND PACKING CORP., of 2, Cumberland Street, Brooklyn, New York 11205, United States of America, a corporation organised and existing under the laws of the State of New York, United States of America, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The use of artificial sweeteners in place of sugar for the reduction of caloric intake, for medical reasons and for simple dietary reasons, is well known. The most common artificial sweeteners are the saccharines and the cyclamates (which latter are sold under the trademark "Sucaryl").

Both of the above groups of substances are much sweeter than sugar and have no caloric value. However, both of the groups of substances suffer from the disadvantage of leaving a bitter after-taste in the mouth of the user and very often a saccharine and a cyclamate are used together in order to lower the degree of bitter aftertaste of the sweeteners.

The cyclamates have about 30 times the sweetening power of pure sugar (when referring to sugar what is meant always is a normal cane sugar or beet sugar which is used commercially for sweetening and which actually consists mainly of sucrose).

The saccharines have a much higher degree of sweetening power, namely 300 times the sweetening power of sugar. The saccharines, however, have an even greater bitter aftertaste than the cyclamates, and the saccharines are most often not used alone, but rather in admixture with a cyclamate. Recently there have been reports that the cyclamates have undesired physiological side effects, and indeed legislation has recently been introduced prohibiting the use of cyclamates as artificial sweeteners in food and soft drinks. This legislation was introduced in view of reports which indicated that a certain percentage of people metabolize the cyclamates into cancer-producing compounds which cause cancer of the

liver and kidney. Other reports indicated that the cyclamates have an undesired effect on the chromosomes so that it is believed that the cyclamates could have a potentially bad effect on future offspring. Moreover, further reports indicated that cyclamates might have an effect on pregnant women which would undesirably affect the fetus.

As a result of such legislation it has been necessary to provide artificial sweetening products which do not contain cyclamates. Such products preferably should not have the undesired bitter aftertaste of saccharine.

A composition comprising saccharine, lactose and cream of tartar powder is known for achieving satisfactory sweetening using saccharine alone has the artificial sweetener, without bitter aftertaste. However, such product contains calories because of the presence of lactose and in fact the equivalent of two teaspoons of sugar would contain about three calories. While this is of course extremely little as far as calories are concerned, three calories are undesirable, particularly in the case of diabetics who might use large amounts of sweetening and who would not wish to upset their carbohydrate intake in any way.

Generally speaking, in accordance with the present invention, a sweetening composition is provided comprising a saccharine artificial sweetener, glucono delta lactone, sodium gluconate and/or potassium gluconate and cream of tartar powder (potassium bitartrate). This composition avoids the bitter aftertaste of the saccharine which would occur using saccharine alone as the artificial sweetener, and at the same time provides no calories so that the composition can be used freely by diabetics.

It is accordingly a primary object of the present invention to provide a sweetening composition which contains only a saccharine as the artificial sweetener but does not have any bitter aftertaste of the saccharine and also has no calories whatsoever, so that the same can be used freely by all persons wishing

[Price 25p]

to reduce their caloric intake and with all types of food.

It is yet a further object of the present invention to provide compositions of a saccharine, glucono delta lactone, sodium gluconate and/or potassium gluconate and cream of tartar powder which have no undesired bitter aftertaste and which can be used with all types of food while providing only a sweetening effect on food which is akin to that of natural sugar.

It is another object of the present invention to provide a cyclamate-free, calorie-free, sodium-free sweetening composition which can thus be used by all persons, including diabetics and those with high blood pressure, and which nevertheless has no undesired bitter aftertaste.

The term "saccharine artificial sweetener" as used throughout the specification and claims of this case is meant to refer to saccharine itself and the salts thereof such as sodium saccharine, potassium saccharine, calcium saccharine, etc.

In accordance with the present invention, the saccharine artificial sweetener is mixed with the cream of tartar powder and with the glucono delta lactone and sodium gluconate and/or potassium gluconate in a ratio of one part of saccharine artificial sweetener to 1/8—5 parts of cream of tartar powder (most preferably 1/6—2 parts), with 2—10 parts of sodium gluconate and/or potassium gluconate (most preferably 3—7 parts) and with 3—15 parts of glucono delta lactone (most preferably 5—10 parts). All parts herein are parts by weight. When these components are used in these proportions, the most desired effect of sweetness approaching that of natural sugar without any bitter aftertaste and without any undesired effect on any food or beverage to which the sweetening composition is used, are obtained.

The present invention provides the possibility of having a cyclamate-free, calorie-free, sodium-free artificial sweetening composition without any bitter aftertaste. Such composition comprises, in the same proportions as indicated above, the use of potassium saccharine or calcium saccharine as the saccharine artificial sweetener, plus glucono delta lactone plus potassium gluconate as the soluble gluconic acid salt, plus cream of tartar (potassium bitartrate).

It should be noted that all of the components of the composition of this invention must be used in combination in order to achieve the desired results. Thus, the use of glucono delta lactone alone or even glucono delta lactone plus the gluconate (e.g. sodium gluconate and/or potassium gluconate) with the saccharine artificial sweetener, the resulting composition cannot be used for the sweetening of milk or milk products because of a danger of curdling. Furthermore, the sweetening of coffee, tea or any other drink

containing tannic acid and/or caffeine cannot be accomplished with such composition without causing discoloration.

On the other hand, if cream of tartar powder alone is used with the saccharine artificial sweetener, it is not possible to mask the bitter aftertaste of the saccharine. It is only by using the cream of tartar powder together with the gluconate and the glucono delta lactone in the proportions indicated above, that it is possible to obtain a complete masking of the bitter aftertaste of the saccharine without adversely affecting the taste of any food or beverage to which the composition is applied while still obtaining a sweetening composition which is entirely free of calories.

The following examples are given to further illustrate the present invention.

The scope of the invention is not, however, meant to be limited to the specific details of the examples.

#### Example 1

15 lbs. of glucono delta lactone, 5 lbs. of sodium gluconate, 1 lb. of soluble saccharine and 2 lbs. of potassium bitartrate are thoroughly and uniformly mixed.

The resulting mixture is many times as sweet as natural sugar so that a small amount thereof can be used in place of sugar to give a sweetening effect without providing any calories. Approximately 1 gram of the composition will give the sweetening effect of two teaspoons of sugar. This composition can be used to sweeten beverages or in cooking, in all quantities even to highly sweeten beverages, without causing any bitter aftertaste and without adversely affecting the taste of the food or beverage to which it is applied.

#### Example 2

A sweetening composition is prepared as in Example 1, however using 5 lbs. of potassium gluconate, 5 lbs. of glucono delta lactone, 1 lb. of saccharine and 1/2 lb. of potassium bitartrate.

Approximately 1 gram of the above product gives the sweetening power approximating that of two teaspoons of sugar.

#### Example 3

A composition is prepared as in Example 1, however, using 6 lbs. of glucono delta lactone, 4 lbs. of sodium gluconate, 10 oz. of sodium saccharine and 2 oz. of potassium bitartrate.

Each gram of the above product gives approximately the sweetening power of two teaspoons of sugar. The product contains no calories.

#### Example 4

A sweetening composition is prepared as in Example 1, however using 3 lbs. of glucono delta lactone, 8 lbs. of sodium gluconate, 1/2

lb. of saccharine, and 1 lb. of potassium bitartrate.

- 5 Approximately 0.5 grams of the above product is used to obtain the sweetening of two teaspoons of ordinary sugar.

#### Example 5

- 10 A sweetening composition is prepared as in Example 1, however using 300 lbs. of glucono delta lactone, 200 lbs. of potassium gluconate, 36 lbs. of calcium saccharine and 6 lbs. 4 ounces of potassium bitartrate.

- 15 This composition contains no carbohydrates, no calories, no cyclamates and no sodium. Approximately 0.024 ounces of the above product is used to obtain the sweetening equivalence of two teaspoons of ordinary sugar.

- 20 Any of the above compositions may be used for the sweetening of beverages, in baking, preparing cooked fruits, in cooking and in making candies.

glucono delta lactone, sodium gluconate and/or potassium gluconate, and cream of tartar powder (potassium bitartrate), in proportions by weight of 3—15 parts of glucono delta lactone, 2—10 parts of sodium gluconate and/or potassium gluconate, and 1/8—5 parts of potassium bitartrate per each part of saccharine artificial sweetener. 25 30

2. A sweetening composition as claimed in claim 1 wherein the proportions of the components are 5—10 parts of glucono delta lactone, 3—7 parts of sodium gluconate and/or potassium gluconate, and 1/6—2 parts of potassium bitartrate per each part of saccharine artificial sweetener. 35

3. A sweetening composition as claimed in claim 1 wherein said saccharine artificial sweetener is saccharine, sodium saccharine, potassium saccharine or calcium saccharine. 40

4. A sweetening composition as claimed in claim 1, substantially as hereinbefore described with reference to the Examples. 45

#### WHAT WE CLAIM IS:—

1. A sweetening composition consisting essentially of a saccharine artificial sweetener,

POTTS, KERR & CO.

Printed for Her Majesty's Stationery Office, by the Courier Press, Leamington Spa, 1972.  
Published by The Patent Office, 25 Southampton Buildings, London, WC2A 1AY, from which copies may be obtained.